

FUNCTIONALIZED SILICA NANOBEADS FOR ORGANIC SOLVENT-FREE CATALYSIS

Period	6 months beginning not later than: <input checked="" type="checkbox"/> January <input checked="" type="checkbox"/> February <input type="checkbox"/> March <input type="checkbox"/> April <input type="checkbox"/> May <input type="checkbox"/> June <input type="checkbox"/> July <input checked="" type="checkbox"/> September 2021
Internship supervisor(s)	name: Dominique Agustin, Associate Professor HDR e-mail: dominique.agustin@iut-tlse3.fr group: UPR 8241 Equipe G (LAC2)- Ligands Architectures Complexes et Catalyse
Location	LCC-IUTA Avenue Georges Pompidou CS 20258 81104 CASTRES - FRANCE
This research master's degree research project could be followed by a PhD <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	

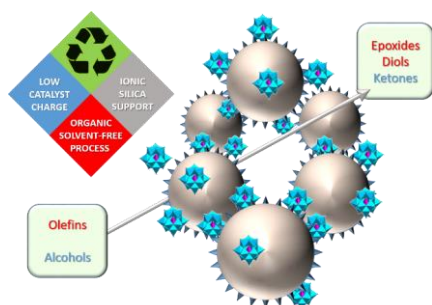


Illustration of nanobeads with polyanions at the surface.

The G group of LCC (part at Castres) develops greener catalytic methods focused on organic solvents-free processes [1] and/or supported catalysts. Recently, polyoxometalates (POMs) ionically grafted on Merrifield resins [2] or functionalized nanosilica beads [3] exhibited catalytic properties towards (ep)oxidation. The aim of this project is to extend the nature of functionalizations on Stöber-nano silica beads to graft catalysts (POMs for (ep)oxidations reactions on natural substrates or tin clusters for transesterification of triglycerides).

The objects will be fully characterized by several techniques present in Castres or Toulouse. All the synthetic and catalytic work will be done in Castres.

References:

- [1] B. Guérin, D. Mesquita Fernandes, J.-C. Daran, D. Agustin, R. Poli, *New. J. Chem.* **2013**, 3466-3475.
 [2] J. Pisk, D. Agustin, R. Poli, *Molecules.* 24(4), **2019**, 783.
 [3] Y. Wang, F. Gayet, P. Guillo, D. Agustin, *Materials*, 12(20), **2019**, 3278.

Keywords, areas of expertise	Stöber process, inorganic chemistry, (ep)oxidation catalysis, coordination chemistry, infrared, DLS, TEM, NMR
Required skills for the internship	knowledge of characterization techniques, basics in catalysis